

AMENDMENT AND PRESENTATION OF CLAIMS

Please replace all prior claims in the present application with the following claims.

1. (Previously Presented) A method of communication in a network access system, whereby functionality of the network access system is distributed among an external processor, a programmable access device, and an access router, said method comprising:

receiving a control message from the external processor, by the programmable access device, to establish a configuration of the programmable access device;

receiving, by the programmable access device, messages from a first network external to the network access system via a first network interface;

processing, by the programmable access device, the messages from the first network to distinguish between various message types and to establish a first subset of the received messages and a second subset of the received messages;

communicating the first subset of the received messages from the programmable access device to the external processor for service processing in accordance with the configuration; and

routing the second subset of the received messages not communicated to the external processor, via the access router, from the network access system via a second network interface different from the first network interface to a second network external to the network access system, wherein the second network is different from the first network.

2. (Previously Presented) The method of Claim 1, wherein:

receiving a control message comprises receiving a filter control message to establish a configuration of a packet header filter in the programmable access device; and

communicating messages comprises communicating network messages filtered from a packet flow by the packet header filter of the programmable access device.

3. (Original) The method of Claim 2, and further comprising limiting communication of network messages from the programmable access device to the external processor by sending the programmable access device a message setting message interface flags in the programmable access device.

4. (Previously Presented) The method of Claim 1, wherein:

receiving a control message comprises receiving a monitor control message to establish a configuration of a monitor in the programmable access device; and

communicating messages comprises communicating reporting messages from the programmable access device to the external processor in response to the configuration of the monitor.

5. (Previously Presented) The method of Claim 4, wherein receiving a monitor control message comprises receiving a control message to establish a threshold number of allowed retransmissions.

6. (Previously Presented) The method of Claim 4, wherein receiving a monitor control message comprises receiving a threshold activity level.

7. (Previously Presented) The method of Claim 1, wherein receiving a control message comprises receiving a policer control message to establish a configuration of a policer in the programmable access device.

8. (Previously Presented) The method of Claim 1, wherein receiving a control message comprises receiving a forwarding table control message to establish a configuration of a forwarding table in the programmable access device.

9. (Original) The method of Claim 8, wherein establishing a configuration of a forwarding table comprises establishing a new forwarding table in the programmable access device.

10. (Previously Presented) The method of Claim 1, wherein receiving a control message comprises receiving a control message to establish a configuration of a scheduler and one or more associated output buffers in the programmable access device.

11. (Previously Presented) The method of Claim 1, wherein receiving a control message comprises receiving a shaper control message to establish a configuration of a shaper in the programmable access device.

12. (Previously Presented) The method of Claim 1, wherein:
receiving a control message from the external processor, to the programmable access device,
to establish a configuration of the programmable access device comprises receiving a
control message specifying a source from which packets are not to be accepted; and

the method further comprises dropping packets from the specified source by the programmable access device.

13. (Original) The method of Claim 1, and further comprising in response to service processing by the external processor, injecting a packet from the external processor into packet flow through the programmable access device.

14. (Previously Presented) The method of Claim 1, wherein

receiving a control message from the external processor, to the programmable access device, to establish a configuration of the programmable access device comprises receiving a session deletion control message; and

the method further comprises the programmable access device deleting a session specified by the session deletion control message.

15. (Original) The method of Claim 1, and further comprising the external processor signaling network hardware to establish a network connection in response to receipt of a message from the programmable access device.

16. (Original) The method of Claim 1, and further comprising exchanging keepalive messages between the external processor and the programmable access device.

17. (Previously Presented) The method of Claim 1, wherein receiving a control message comprises accessing a control processor on the external processor via an application programming interface.

18. (Original) The method of Claim 1, and further comprising in response to said control message, sending an acknowledgement from said programmable access device to said external processor.

19. (Original) The method of Claim 1, and further comprising communicating a state of a session from the programmable access device to the external processor in response to failure of a service controller servicing the session in the external processor.

20. (Previously Presented) The method of Claim 1, wherein receiving a control message comprises receiving a control message via an intermediate communication network.

21. (Currently Amended) A network access system, whereby functionality of the network access system is distributed among an external processor, a programmable access device, and an access router, comprising:

an external processor that transmits a control message specifying a configuration;

a programmable access device that receives messages from a first network external to the network access system via a first network interface, processes the messages from the first network to distinguish between various message types, establishes a first subset of the received messages and a second subset of the received messages; and

an access router;

wherein, responsive to the control message, the programmable access device establishes the configuration specified by the control message and communicates the first subset of the received messages to the external processor for service processing in accordance with the configuration, and forwards the second subset of the received messages not

communicated to the external processor to the access router for routing, via a second network interface different from the first network interface, to a second network external to the network access system, wherein the second network is different from the first network.

22. (Original) The network access system of Claim 21, wherein:

the programmable access device includes a packet header filter;

the control message comprises a filter control message that establishes a configuration of the packet header filter; and

the messages communicated by the programmable access device comprise network messages filtered from a packet flow by the packet header filter of the programmable access device.

23. (Original) The network access system of Claim 22, said external processor comprising means for limiting communication of network messages from the programmable access device to the external processor by sending the programmable access device a message setting message interface flags in the programmable access device.

24. (Original) The network access system of Claim 21, wherein:

the programmable access device comprises a monitor for network traffic;

the control message comprises a monitor control message that specifies a configuration of the monitor; and

the messages communicated by the programmable access device comprise reporting messages in accordance with the configuration.

25. (Original) The network access system of Claim 24, wherein the control message specifies a threshold number of allowed retransmissions.

26. (Original) The network access system of Claim 24, wherein the monitor control message specifies a threshold activity level.

27. (Original) The network access system of Claim 21, wherein:
the programmable access device comprises a policer, and
the control message comprises a policer control message that specifies a configuration of the
policer.

28. (Original) The network access system of Claim 21, wherein the control message comprises a forwarding table control message that specifies a configuration for a forwarding table.

29. (Original) The network access system of Claim 21, wherein:
the programmable access device comprises one or more output buffers for outgoing packets
and an associated scheduler; and
the control message specifies a configuration of the scheduler and the one or more output
buffers.

30. (Original) The network access system of Claim 21, wherein:
the programmable access device comprises a shaper; and
the control message comprises a shaper control that specifies a configuration of the shaper.

31. (Original) The network access system of Claim 21, wherein:
the control message specifies a source from which packets are not to be accepted; and
the programmable access device comprises means for dropping packets from the specified source.
32. (Original) The network access system of Claim 21, said external processor comprising means, responsive to service processing by the external processor, for injecting a packet into packet flow through the programmable access device.
33. (Original) The network access system of Claim 21, wherein
the control message comprises a session deletion control message; and
the programmable access device comprises means for deleting a session specified by the session deletion control message.
34. (Original) The network access system of Claim 21, wherein the external processor comprises a signaling processor that signals network hardware to establish a network connection in response to a message received from the programmable access device.
35. (Original) The network access system of Claim 21, said external processor and said programmable access device each comprising means for exchanging keepalive messages.
36. (Original) The network access system of Claim 21, wherein the external processor comprises a control processor that outputs said control message and an application programming interface through which said control processor is accessed.

37. (Original) The network access system of Claim 21, said programmable access device comprising means, responsive to said control message, for sending an acknowledgement to said external processor.

38. (Original) The network access system of Claim 21, wherein:
the external processor comprises a plurality of service controllers that provide service processing; and
the programmable access device comprises means for communicating a state of a session to the external processor in response to failure of a service controller servicing the session.

39. (Original) The network access system of Claim 21, and further comprising a network coupling the external processor and the programmable access device.

40. (Previously Presented) A distributed router comprising:
a first network interface through which packets are communicated with a first network;
a second network interface different from the first network interface through which packets are communicated with a second network different from the first network;
a programmable access device configured to input messages from the first network via the first network interface;
an external processor configured to receive, from the programmable access device, a first subset of the input messages and to transmit a control message to the programmable access device specifying a configuration to control the selection of the first subset; and
an access router configured to route messages between input and output ports of an access network,

wherein the programmable access device forwards a second subset of the input messages not received by the external processor to the access router for routing via the second network interface to the second network.

41. (New) The network access system of Claim 21, wherein the access router comprises a forwarding table, and Exterior Gateway Protocol (EGP) and Interior Gateway Protocol (IGP) routing tables.

42. (New) The network access system of Claim 21, further comprising:
a third network coupling the programmable access device to the access router.

43. (New) The network access system of Claim 42, wherein the coupling is made via one of an Asynchronous Transfer Mode (ATM) switch and a Multi-Protocol Label Switching (MPLS) switch.